

Abandoned Mines Recognized as Environmental Hazards With Incurred and/or Future Capital Costs April 4, 2007

Explanation:

1. The 117 abandoned mine sites on the list are assigned to one of three tiers based on capital cost of clean up.
 - a. **Tier 1** includes abandoned mines where past and estimated capital costs range between \$10 to 100 million or more.
 - b. **Tier 2** includes abandoned mines where past and estimated capital costs range between \$ 1 to 10 million.
 - c. **Tier 3** includes abandoned mines where past and estimated capital costs range between \$ 100,000 to \$ 1 million.

Each tier is subdivided into two subtiers (a and b).

- a. **Subtier (a)** contains sites where capital costs were incurred.
 - b. **Subtier (b)** contains sites where there are only future capital cost estimates.
2. The list is further sorted within each tier by “problem” and then by “county.” The sort illustrates that Acid Rock Drainage (ARD), which is historically the most expensive problem, dominates Tier 1 sites (60%). Mercury (44%) and ARD (38%) dominate Tier 2 sites. Arsenic (36%) and mercury (30%) dominate Tier 3 sites. The list may also be sorted by county, ownership, administrative agency, etc if desired. Data presented represent a snapshot in time, and California’s federal and state AML agencies anticipate that the list will change in the future.
3. Federal and state landowning agencies provided cost information. Capital costs for abandoned mines with no cost history or estimate were estimated by comparing them to a similar site with known costs. Although cost data are incomplete, these data both demonstrate that substantial funds have been spent on abandoned mines (at least \$370 million), and suggest that future capital costs would likely be in the same range (at least \$380 million estimated). However, the list was not designed to, and thus, does not assign a schedule or order of clean up for the sites on the list.

General Abbreviations/Terms (listed below and in the footnotes):

ARD = Acid Rock Drainage (a low pH, metal-rich mine water produced by pyrite oxidation)

As = Arsenic

BLM = Bureau of Land Management

Cu = Copper

Hg = Mercury

DTSC = Department of Toxic Substances Control (State)

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USFS = United States Forest Service

Tier 1a (\$10 to \$100 million)—Capital Costs Incurred

<u>Mine Name</u>	<u>Owner-ship</u>	<u>Admin. Agency</u>	<u>County</u>	<u>Problem</u>	<u>WQ Priority</u>	<u>Human Exposure Priority</u>	<u>Site Status</u>	<u>Incurred Capital Cost (\$ millions)</u>	<u>Future Capital Cost (\$ millions)</u>	<u>O&M/yr (\$ millions)</u>	<u>Funding Status</u>
Leviathan (NPL)	State/USFS	EPA/RWQCB	Alpine	ARD	H	H	RI/FS on-going Early Response Actions completed. Trustees will do natural resource damage assessment. Active treatment planned. Active treatment system in design phase, site restoration on going.	4	30	1.6	Funding from state in-place. PRP Enforcement Lead long-term funding to be negotiated with PRP.
Penn Mine	PVT	SWRCB	Calaveras	ARD	H	L	Waste landfill and site restoration completed.	12	Unknown	Unknown	O&M funded
Iron Mt (NPL)	PVT	EPA/DTSC*	Shasta	ARD	H	H	Active treatment system built, site restoration ongoing.	PRP 200, EPA 100	40	4.5	O&M funded, future capital unfunded.
Mammoth	PVT	RWQCB	Shasta	ARD	H	M	Plug, passive treatment planned	10	Cost data pending	Cost data pending	Unknown
Lava Cap (NPL)	PVT	EPA/DTSC*	Nevada	As	H	H	Remedial Investigation underway for 2 OUs. Removal action completed for one OU. Remedial Action underway for another OU.	8	30	0.4	Partially funded
Atlas (NPL)	PVT/BLM	EPA/DTSC*	Fresno	Asbestos	M	H	Site restoration implemented. Cleanup of processing are under review. Risk Assessment for Off-Road Area Continuing.	15	0	0.1	Process area review. Risk study funded
Sulfur Bank (NPL)	PVT	EPA/DTSC*	Lake	Hg, sediments	H	H	Site characterization/removal actions completed. Remediation decision for mine pending. RI/FS needed for Lake bottom sediment.	5	35 for mine. Costs for cleanup of lake bottom not estimated.	Unknown	Partially funded

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Tier 1b (\$10 to \$100 million)—Future Capital Costs

<u>Mine Name</u>	<u>Owner-ship</u>	<u>Admin. Agency</u>	<u>County</u>	<u>Problem</u>	<u>WQ Priority</u>	<u>Human Exposure Priority</u>	<u>Site Status</u>	<u>Incurred Capital Cost (\$ millions)</u>	<u>Future Capital Cost (\$ millions)</u>	<u>O&M/yr (\$ millions)</u>	<u>Funding Status</u>
Copperopolis	PVT	RWQCB	Calaveras	ARD	H	H	Recon. sampling performed.	0	10	Unknown	No Funding
Copper Bluff	Hoopa Tribe	RWQCB	Humboldt	ARD	H	L	Recon. sampling performed. EPA plans no further involvement. Priority for tribe. Geologic stability issues.	0	10	Unknown	No Funding
Empire	State	RWQCB/DTSC	Nevada	As	M	H	Site investigation underway.	1.5	15	Unknown	Partially funded
Rand Project (Kelly Mine)	BLM/PVT	BLM	San Bernardino - Kern	As, Anti-mony	Unknown	H	CERCLA Action completed RI/FS planned Note; Kelly, Johannesburg and Atolis were combined.	0	120 - 150	Unknown	Unknown
New Idria	PVT	SWRCB/DTSC	San Benito	Hg	L	H	PA/SI complete. Site qualifies for the NPL consideration. Future activities uncertain.	0	20	Unknown	Unknown

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Spenceville	State	RWQCB	Nevada	ARD	H	L	Waste land-filled, site restored, in O&M.	7.5	Cost data pending	2	O&M funded
Walker	PVT	RWQCB	Plumas	ARD	H	L	Plug completed, in O&M	1	Cost data pending	2	O&M funded
Balakalala	PVT	RWQCB	Shasta	ARD	M	L	DTSC and EPA have triaged site. Appears that RWQCB is addressing. Plug, passive treatment in-place.	Cost data pending	Cost data pending	Cost data pending	Project funded
Bully Hill	PVT	RWQCB	Shasta	ARD	M	L	Plug, passive treatment planned	Cost data pending	Cost data pending	Cost data pending	Project funded
Early Bird	PVT	RWQCB	Shasta	ARD	M	L	Plug in-place	Cost data pending	Cost data pending	Cost data pending	Project funded
Golinsky	USFS	USFS	Shasta	ARD	H	L	Site investigation, remedy selection underway.	2.3	1.4	75	Remedy unfunded
Keystone	PVT	RWQCB	Shasta	ARD	M	L	Plug, passive treatment in-place	Cost data pending	Cost data pending	Cost data pending	Unknown
Mason	PVT	RWQCB	Shasta	ARD	M	L	Plug in-place	Cost data pending	Cost data pending	Cost data pending	Unknown
Shasta King	PVT	RWQCB	Shasta	ARD	M	L	Plug in-place	Cost data pending	Cost data pending	Cost data pending	Unknown
Stowell	PVT	RWQCB	Shasta	ARD	M	L	Plug, passive treatment in-place	Cost data pending	Cost data pending	Cost data pending	Unknown

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Sutro	PVT	RWQCB	Shasta	ARD	M	L	Plug in-place	Cost data pending	Cost data pending	Cost data pending	Unknown
Rising Star	PVT	RWQCB	Shasta	ARD	M	L	Plug, passive treatment planned	Cost data pending	Cost data pending	Cost data pending	Unknown
Grey Eagle	PVT/US FS	EPA	Siskiyou	ARD	H	L	EPA removal action 1999 to stabilize tailings pile. Permanent work needed.	2	0	0	No funding
Mesa De Oro Tailings	PVT	DTSC	Amador	As	L	H	Waste capped, in O&M	7	0	50	Funded
Walker Mine Tailings	USFS	USFS	Plumas	Copper, silica	M	M	Dust supression, site restoration, stream restoration work ongoing.	1.4	2.1	50	Funded
Gambonini	PVT	RWQCB	Marin	Hg	H	L	U.S. EPA conducted removal actions. No further federal action planned. Waste landfill, site restoration completed.	3	Unknown	Unknown	No funding
Polar Star	PVT	EPA	Placer	Hg	L	H	Part of Nichols Diggings sluice tunnel system. U.S. EPA conducted removal action. No further federal action planned. Tunnel cleanout completed	1.5	Unknown	Unknown	No funding
Buena Vista/Klau (NPL)	PVT/BLM	EPA/DTSC*	San Luis Obispo	Hg, ARD	H	L	Some removal work has been done.	4	Cost data pending	75	Unknown
New Almaden	County	DTSC	Santa Clara	Hg	L	H	Waste landfill completed, site restoration on-going.	4	Cost data pending	Cost data pending	Unknown

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Pioneer Pit	PVT	RWQCB	Sierra	Hg, sediment	M	H	EPA removal completed 2005. No further action planned.	2	Unknown	Unknown	No funding
New London, Primera, La Trinidad, Pick & Shovel	State	RWQCB	San Luis Obispo	Sedi-ments, chromium	H	L	Soil contouring, revegetation w/irrigation, drainage strutures, & sediment basin clean out completed to date. Further erosion control needed, esp. New London	2.5	3	50	No funding

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Poison Lake mill tailings	EBMUD/BLM	RWQCB	Amador	ARD	M	L	CERCLA- Prelim investigation –completed - (50%)	0.1	6	Unknown	No funding
Newton	PVT	RWQCB	Amador	ARD	M	M	Recon. sampling performed	0	3	Unknown	No funding
Horse Mountain	USFS	USFS	Humboldt	ARD, metals	M	M	Recon. sampling performed	0	2	Unknown	No funding
Dairy Farm	Water district	RWQCB	Pacer	ARD	H	H	Recon. sampling performed	0	2	Unknown	No funding
Valley View	PVT	EPA/DTSC	Placer	ARD	M	L	EPA currently assessing. DTSC performed a PA in 2003.	0	1	Unknown	No funding
Greenhorn	PVT	RWQCB	Shasta	ARD	M	L	Recon. sampling performed	Unknown	Unknown	Unknown	Unknown
Afterthought	PVT	RWQCB	Shasta	ARD	M	L	Recon. sampling performed	Unknown	Unknown	Unknown	Unknown
Argonaut Tailings	PVT	DTSC	Amador	As	L	H	PA complete 1999. Further investigation needed.	0	2	Unknown	No funding
Davis Mine	BLM/DTSC	BLM	Nevada	As	M	H	CERCLA- Prelim investigation completed	0.1	5	Unknown	No funding
Hoge	PVT	DTSC	Nevada	As, Hg	M	M	Recon. sampling performed	0	5	Unknown	No funding
Cherokee	PVT/BLM		Butte	Hg	L	H	Visual inspection performed. Further investigation needed.	0	3	Unknown	No funding
Mt Diablo	PVT/State	RWQCB	Contra Costa	Hg, ARD	H	L	Recon. sampling performed	0	2	Unknown	No funding
Abbott	PVT/BLM	EPA	Lake	Hg	H	M	RP addressing continuing mercury source at mine. Site investigation underway.	Cost Data Pending	2.5	Unknown	RP paying for cleanup.
Turkey Run	PVT/BLM	EPA	Lake	Hg	H	L	RP addressing continuing mercury source at mine. Site investigation underway.	Cost Data Pending	2.3	Unknown	RP paying for cleanup.

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Rathburn	BLM	RWQCB	Lake	Hg	M	L	CERCLA- Prelim investigation –completed - (75%)	0.1	1.9	Unknown	Unknown
Petray	BLM/ PVT	RWQCB	Lake	Hg	L	L	CERCLA- Prelim investigation –completed - (75%)	0.1	1.1	Unknown	Unknown
Oat Hill Extension	BLM	BLM	Napa	Hg	M	M	CERCLA- Prelim investigation –completed - (90%)	0.1	0.9	Unknown	Unknown
Relief Hill	PVT/ USFS	USFS	Nevada	Hg	L	M	In site characterization, remedy selection phase	0.16	2.2	Unknown	Remedy unfunded
Starr Mine	PVT/ BLM	BLM	Nevada	Hg	L	M	Recon. sampling performed	0	1	Unknown	No funding
Poore Mine	BLM	BLM	Nevada	Hg	L	M	CERCLA- Prelim investigation completed	0.1	1.2	Unknown	No funding
Birds Eye Tunnel	PVT/ BLM	BLM	Nevada	Hg	L	H	Recon. sampling performed	0	3	Unknown	No funding
You Bet	BLM/ PVT	BLM	Nevada	Hg, ARD	L	M	Recon. sampling performed	0	3	Unknown	No funding
Pond	BLM	BLM	Placer	Hg	L	H	CERCLA- Prelim investigation completed	0.2	3	Unknown	Remedy unfunded
Southern Cross	PVT	Unknown	Placer	Hg, nickel	L	H	Visual inspection performed.	0	3	Unknown	No funding
Yankee	PVT	Unknown	Placer	Hg	M	M	Visual inspection performed.	0	5	Unknown	No funding
Gold Run	PVT/ BLM	BLM	Placer	Hg, ARD	L	H	Recon. sampling performed	0	3.5	Unknown	No funding
Kings Mine	BLM/ USFS	BLM/USFS	San Luis Obispo	Hg	M	M	Unknown	0	1	Unknown	Unknown
Bolts Hill	BLM	BLM	Trinity	Hg	L	M	Recon. sampling performed.	0	1	Unknown	No funding

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Altoona	PVT/ USFS	USFS	Trinity	Hg, As	M	M	Recon. sampling performed. U.S EPA plans removal action on private portion in Spring 2007.	0	4	Unknown	Funding requested
Reed	BLM	RWQCB	Yolo	Hg	H	L	Investigation completed 1993. No further action planned.	0	1	Unknown	Unknown
Juniper Uranium Mine	USFS	USFS	Alpine	Radiation, radio-nuclides	M	H	Site investigation, remedy selection completed.	0.5	4.6	Unknown	Remedy unfunded

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Zaca	USFS	RWQCB	Alpine	ARD, As	H	Unknown	Some work has been done, information pending	Cost data pending	Cost data pending	Cost data pending	Cost data pending
Morning Star	USFS	USFS	Alpine	ARD, As	M	M	Recon. Sampling performed	Unknown	Unknown	Unknown	Unknown
Spanish	PVT	RWQCB	Nevada	ARD	L	L	NPDES permit issued.	0	500	15	Unknown
Williams Brothers Mine	USFS	USFS	Fresno	As, ARD, hazardous materials and explosives.	H	H	CERCLA removal completed, ARD remedy pending	250	315	9	Funding secured for remedy construction but not O&M
Ruth	BLM	BLM	Inyo	As	M	M	CERCLA investigation under way.	50	Cost data pending	Cost data pending	Unknown
La Trinidad	USFS	USFS	Placer	As	L	H	Waste removal completed.	258	0	10	None needed
Ancho Erie	USFS	USFS	Sierra	As, lead	M	M	Waste removal completed.	347	0	10	None needed
Siskon	USFS	USFS	Siskiyou	As, hazardous materials	L	M	Waste encapsulated, site restored. Site inspection needed.	750	0	30	Unknown
Coalinga Asbestos (NPL)	PVT	EPA	Fresno	Asbestos	L	H	In O&M	Cost data pending	Cost data pending	Cost data pending	Funded
Boston	BLM/PVT	BLM	Nevada	Hg	L	H	Tunnel cleanout completed	500	0	1	Funded
Alpine	BLM	BLM	San Benito	Hg	M	L	Waste repository built	330	100	Cost data pending	Unknown
Clear Creek Dredgefield	BLM	BLM	Shasta	Hg	M	L	Stream restoration underway	800	400	Cost data pending	Funded

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Ziebright	PVT/ USFS	EPA	Nevada	Lead, As, Hg	L	H	EPA Removal action completed. No further remedial action planned.	100	Unknown	Unknown	No funding

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Tier 3b (\$100K to \$1 million)—Future Capital Costs

<u>Name</u>	<u>Owner-ship</u>	<u>Admin. Agency</u>	<u>County</u>	<u>Problem</u>	<u>WQ Priority</u>	<u>Human Exposure Priority</u>	<u>Site Status</u>	<u>Incurred Capital Cost</u> (\$ thousands)	<u>Future Capital Cost</u> (\$ thousands)	<u>O&M/yr</u> (\$ thousands)	<u>Funding Status</u>
Cleopatra	USFS	USFS	Del Norte	ARD	H	L	No work	0	900	Unknown	No funding
Alta	USFS/ PVT	USFS	Del Norte	ARD	M	M	Site investigation planned.	0	400	Unknown	Site Invg. 2007
LT2	USFS	USFS	Del Norte	ARD	H	M	No work	0	100	Unknown	No funding
Central Eureka Headframe	PVT	DTSC	Amador	As	L	H	EPA removal. Currently deferred to State.	0	500	Unknown	No funding
Old Eureka	PVT	DTSC	Amador	As	L	H	Remedy selection in progress	0	700	Unknown	No funding
South Eureka	PVT	DTSC	Amador	As	L	H	Remedy selection in progress	0	700	Unknown	No funding
Kennedy Mine/ tailings	PVT	DTSC	Amador	As	M	M	EPA Preliminary Assessment completed 1989. No further federal action planned	0	500	Unknown	No funding
Surcease	PVT	EPA	Butte	As	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	No funding
Four Oaks	USFS	USFS	Kern	As	M	M	PI and remedy selection complete	0	125	Unknown	PI and remedy selection funded, remedy unfunded
Old Amy	USFS	USFS	Kern	As	M	M	Erosion control waste removal	0	77	Unknown	No funding
French Meadows	USFS	USFS	Kern	As	M	M	Erosion control waste removal	0	94	Unknown	No funding

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Black Bob	USFS	USFS	Kern	As	M	M	Site characterization/remedy selection complete.	45	295	Unknown	No funding
Idaho Maryland tailings	PVT	DTSC	Nevada	As	L	M	Unknown	0	500	Unknown	Unknown
Poorman Creek Forks	USFS	USFS	Nevada	As	M	H	Recon. sampling performed.	27	335	Unknown	No funding
Lucky Green Mine	BLM	BLM	San Bernardino	As, thallium, Cu	M	M	No work	0	300	Unknown	No funding
Dewey	USFS	USFS	Shasta	As	M	M	No work	0	500	Unknown	No funding
Lower Brush Creek	USFS	USFS	Sierra	As	M	H	PI and remedy selection sched. for 2008	75	275	Unknown	PI and remedy funded
Iron Dike	USFS	USFS	Plumas	Cadmium, copper	H	L	Recon. sampling performed.	23	250	Unknown	No funding
Grey Eagle	USFS	USFS	Tehema	Chromium, sediment	L	L	Unknown	0	500	Unknown	Unknown
Gold Hill	USFS	USFS	Del Norte	Copper	M	L	No work	0	300	Unknown	No funding
Rex Montis	USFS	USFS	Inyo	Hazardous substances	M	M	Recon. sampling performed.	0	250	Unknown	No funding
Garnet Dike	USFS	USFS	Kings	Hazardous substances	M	H	Recon. sampling performed.	0	90	Unknown	No funding
Johnson Sink Placer Mine	USFS	USFS	Nevada	Hazardous substances	M	H	No work	0	375	Unknown	No funding

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Hard-scrabble	USFS	USFS	Del Norte	Heavy metals	M	M	Site investigation planned.	35	500	Unknown	PI funded 2007
Webb	USFS	USFS	Del Norte	Hg	H	L	No work	0	500	Unknown	No Funding
Hanna Millsite	USFS	USFS	Inyo	Hg, lead, As	H	H	Recon. sampling performed.	34	690	67	No Funding
Central, Cherry Hill, Empire, Manzanita and West End Mines	BLM/PVT	BLM	Lake	Hg	M	L	Unknown	0	556	58	Unknown
Elgin	PVT	RWQCB	Lake	Hg	M	L	No work	0	389	18.5	No funding
Wide Awake Mine	BLM/PVT	BLM	Lake	Hg	M	L	Unknown	0	545	38	Unknown
Sulfur Creek	BLM/PVT	BLM	Lake	Hg	H	L	Recon. sampling performed.	0	897	83	Unknown
Helen Mine	BLM/PVT	BLM	Lake	Hg	H	L	Recon. sampling performed.	50	950	Unknown	Unknown
Harley Gulch Wetland	BLM/PVT	BLM	Lake	Hg	H	L	Recon. sampling performed.	0	726	58	Unknown
Knoxville	PVT	RWQCB	Napa	Hg	M	M	Recon. sampling performed.	0	300	Unknown	Unknown
North Star Central Shaft	PVT	DTSC	Nevada	Hg	L	M	Unknown	0	300	Unknown	No funding
Robinson Mine	USFS	USFS	Plumas	Hg	M	L	Recon. sampling performed.	0	250	Unknown	No Funding

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Sonoma	BLM/ PVT	BLM	Sonoma	Hg	H	L	Recon. sampling performed.	50	850	Unknown	Unknown
Contact Mine/Mill	BLM/ PVT	BLM	Sonoma	Hg	H	L	Recon. sampling performed.	50	650	Unknown	Unknown
Bean Hill Hydraulic Mine	USFS	USFS	Plumas	Sediment	M	M	No work	0	300	Unknown	No funding
Excelsior Hydraulic Mine	USFS	USFS	Sierra	Sediment	M	L	No work	0	335	Unknown	No funding
Holiday	USFS	USFS	Del Norte	Zinc, copper	M	L	No work	0	800	Unknown	No funding

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